ABSTRACT

Disclosed herein is a method for forming an isolation film in a silicon substrate, using a shallow trench isolation (STI) process. This method comprises the steps of: successively depositing a pad oxide film, a pad nitride film and a poly-silicon film on a silicon substrate; patterning the deposited films to expose a portion of the substrate, which correspond to a field region; etching the exposed portion of the substrate to form a trench; depositing an HDP-oxide film on the substrate to the same thickness as the sum of the thickness of the deposited films and the depth of the trench in such a manner as to fill the trench; forming a reverse mask on the HDP-oxide film, which covers the field region and a portion of an active region extending inward from the edge of the active region by a given distance; etching an exposed portion of the HDP-oxide film formed on the active region using the reverse mask as an etch barrier; removing the reverse mask; subjecting the HDP-oxide film and the poly-silicon film to chemical mechanical polishing (CMP); and removing the pad nitride film. According to the present invention, before subjecting the HDP-oxide film to the CMP step, the step height of the HDP-oxide is removed to improve CMP uniformity. Also, since an oxide etchant is not used in the removal of the pad

nitride film, the formation of a moat can be basically inhibited.